Fw: Chuitna Site-specific Study

William Beckwith to: Powell, James E (DEC), kenwyn.george, 09/15/2009 02:23 PM

This is a resend, as I received several undeliverable notices.

----- Forwarded by William Beckwith/R10/USEPA/US on 09/15/2009 02:14 PM -----

William Beckwith/R10/USEPA/US
09/15/2009 02:11 PM

To Powell, James E (DEC)" <jim.powell@alaska.gov/OU=, "George/R10/USEPA/US, Kenwyn P (DEC)" <kenwyn.george@alaska.gov/OU=, "Nakanishi/R10/USEPA/US, Allan S (DEC)" <allan.nakanishi@alaska.gov/O=, Hanh Shaw/R10/USEPA/US, Cindi Godsey/R10/USEPA/US, phil_brna@fws.gov//

cc

Subject Chuitna Site-specific Study

Hello All - Some thoughts in follow-up to the revised study plan and our 9/10/09 meeting.

Please contact me if you have questions - Bill
206-553-2495

- For clarification, the aluminum aquatic life chronic criterion was lowered to protect two important species, i.e. brook trout and striped bass, which is a step beyond the initial criterion calculation and is provided for in EPA's 1985 guidelines for criteria development (Stephan et al 1985). The proposed study plan discussion of the aluminum chronic criterion does not seem to recognize this step, in implying that derivation of the aluminum chronic criterion was inconsistent with the guidelines (study plan section 2.2, pages 8-9).

- The proposed study plan includes a stated intent that the WER laboratory water toxicity tests for aluminum will be conducted at pH 6.5-6.6 and a hardness of approximately 12 mg/l, to simulate the characteristics of the solutions in the studies upon which Alaska's chronic aluminum criterion is based (Section 5.9, page 25). Water quality data presented in the proposed study plan shows that pH in the Chuitna Basin is also below 7.0 at times (with values as low as 6.4-6.5 reported), and that hardness is often at or below 10 mg/l (Tables 2 through 7 and Table A1). Based on the information presented to date, it maybe important to ensure that WER site water toxicity tests are conducted at such conditions as well. With this in mind, it would be useful to know if pH is expected to drift during the tests, and if so, how testing at a desired pH will be controlled.

- There was a comment made during the 9/10/09 discussion with the applicant that may have implied to some that reducing "n" in the recalculation procedure ensures a conservative criterion. Reducing the

number of genus mean acute values (GMAVs) in the national data set for a metal (i.e, reducing the value of "n") without changing (increasing) any of the lowest four GMAVs will result in a comparatively lower criterion value. However, reducing "n" is not necessarily a conservative offset for increases in the lowest four GMAVs.

- It would be appropriate to further clarify the metals analysis to be conducted on the toxicity test solutions. It remains unclear in the revised study plan if adequate measurements will be made to verify the dissolved metals concentrations through the tests.

- In its WER guidance, EPA generally suggests that ambient site water samples affected by recent storm water run-off that might elevate suspended solids and organic matter not be used (this said, snow melt conditions, though not necessarily snow melt conditions driven by a storm event, are discussed in the 1994 guidance as a potential concern due to the possibility that associated reduced hardness, pH, and alkalinity might cause the toxicity of a metal to increase at a rate greater than is offset by increased stream flow and dilution of the metal). During the discussion on 9/10, the applicant seemed to imply that a storm event influenced stream condition would be targeted for sampling/WER analysis. This further heightens the importance of reviewing the WER test results and accompanying water quality data before determining how a final WER will be calculated from a set of WERs. It would not be appropriate to commit to use of a geometric mean of three WERs.

- EPA's has commented that following WER analysis toxicity tests should be conducted in site water with each metal at its proposed site-specific criterion ("mixed metal" tests). In response, the applicant is correct that such testing is not used by EPA in establishing its national criteria guidance. Such testing is, however, part of EPA's 1994 WER guidance for site-specific criteria development. Standard EPA test durations should be used, not the abbreviated durations suggested by the applicant.

- Included below is the content of an email concerning iron that I sent to some of you on 9/9/09. I have not heard details on how the SAB review went.

> Through communications with staff at EPA's National Center for Environmental Assessment and EPA's Health and Ecological Criteria Division at EPA I have learned that it is not accurate to say that Conditional Probability Analysis (CPA) is an EPA recommended approach for developing site-specific criteria for iron and nutrients. Nevertheless EPA has found that empirical approaches using field data are appropriate for deriving criteria for such pollutants. There is a draft "Empirical Approaches for Nutrient Criteria Derivation" document scheduled for Science Advisory Board review this week (September 9-11, 2009), that can be accessed at the link below. CPA is presented in that document for use in data exploration, to screen variables for use in development of stressor-response relationships, and to estimate the proportion of waterbodies currently meeting or not meeting a selected end point in a sample population of all waterbodies with a pollutant concentration at or above one or more proposed candidate criteria. CPA is not recommended, however, as a method for establishing stressor-response

however, as a method for establishing stressor-response relationships and associated numeric values that might be used as criteria. A comment was also made that the sample size of 22 is very small for such an analysis, and the sites are likely to be autocorrelated as they are from a single basin. I will try to follow-up on this given that the proposal is to develop criteria for a single basin.

The following points have also been made for criteria development:

- One or more individual endpoints that measure adverse response to the stressor of concern should be considered rather than an index such as an index of biological integrity (IBI)

- Appropriate selection of the acceptable effect level for the endpoint is critical for ensue protection consistent with Clean Water Act goals.

- Effects on invertebrates should be evaluated as well as effects on fish.

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